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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,545	04/04/2002	Toshiaki Murata	KAW 2 0103	6557

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

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DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,545	MURATA ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-17,19-21 and 23* is/are rejected.

7)☒ Claim(s) *18 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/22/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This is in response to the Amendment dated December 22, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Claim Rejections - 35 USC § 112

Claim **18** has been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claim 18 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

Method

I. Claims **15-17 and 23** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 10-155887** ('887) in combination with **Ohmori et al.** (US Patent No. 6,414,213 B2).

The rejection of claims 15-17 and 23 under 35 U.S.C. 103(a) as being unpatentable over JP 10-155887 ('887) in combination with Ohmori et al. is as applied in the Office action dated August 18, 2003 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that they cannot ascertain whether the '213 reference is a prior art reference. In response, the Examiner has ordered the Provisional Application Serial No. 60/115,149, filed on January 7, 1999 and will provide Applicants with a copy of the provisional application when received by the Examiner to show that Ohmori is prior art.

Applicants state that the Examiner has provided no motivation to combine the references to arrive at a method that may include a step of radiating ultraviolet rays at a wavelength of 200 nm or longer but shorter than 300 nm in the presence of a photocatalyst. Ohmori only teaches the use of an irradiation energy of 365 nm to initiate photocatalytic activity. In response, to arrive at a method that *may include* a step of radiating ultraviolet rays at a wavelength of 200 nm or longer but shorter than 300 nm in the presence of a photocatalyst is not obligatory. Thus, the present situation is "may not", and therefore, the prior art does not need to provide any motivation for this.

Nevertheless, claim 15 recites that "at least one of said second step *or* said third step being conducted in the presence of a photocatalyst including at least one of particles of titanium oxide of an orthorhombic crystal system or particles of titanium oxide of an orthorhombic crystal system supporting fine particles of another metal".

The third step of claim 15 irradiates ultraviolet rays of a wavelength of 300 nm or longer, but shorter than 380 nm. The photocatalyst is present in the second *or* third step (not in both steps).

It would have at least been obvious to coat the UV irradiation cylinder **44** of JP '887 with particles of titanium oxide of an orthorhombic crystal system because the UV irradiation cylinder **44** provides ultraviolet rays of a wavelength of 300 nm or longer, but shorter than 380 nm (= 300-420 nm) [page 2, ¶ [0008] and [0010]], and thus, this would have been sufficient to initiate photocatalytic activity of the particles of titanium oxide of an orthorhombic crystal system when present.

Applicants state that the inventors of the present development have found that irradiating ultraviolet rays of a medium wavelength of 200-300 nm in the presence of a photocatalyst, after irradiating ultraviolet rays of a shorter wavelength of 110-200 nm, can purify a large quantity of soiled air effectively, even in the shadow portions of the ultraviolet lamp. In response, claim 15 as presently written does not require the second step to be conducted in the presence of a photocatalyst. The presence of a photocatalyst in the second step is not obligatory.

II. Claim **18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 10-155887** in combination with **Ohmori et al.** (US Patent No. 6,340,711 B1) as applied to claims 15-17 and 23 above, and further in view of **JP 10-249356** ('356).

The rejection of claim 18 under 35 U.S.C. 103(a) as being unpatentable over JP 10-155887 in combination with Ohmori et al. as applied to claims 15-17 and 23 above, and further in view of JP 10-249356 ('356) has been withdrawn in view of Applicants'

remarks.

Apparatus

III. Claims **19-21** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 10-155887** ('887) in combination with **Ohmori et al.** (US Patent No. 6,414,213 B2).

The rejection of claims 19-21 under 35 U.S.C. 103(a) as being unpatentable over JP 10-155887 ('887) in combination with Ohmori et al. is as applied in the Office action dated August 18, 2003 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that Ohmori only teaches using a photocatalyst in the presence of an irradiating energy from rays of 365 nm. In response, claim 19 recites that "at least a part of wall surface of at least one of said second treating room *or* said third treating room to which ultraviolet rays are radiated being covered with a photocatalyst including at least one of particles of titanium oxide of an orthorhombic crystal system or particles of titanium oxide of an orthorhombic crystal system supporting fine particles of another metal".

The third treating room of claim 19 radiates ultraviolet rays of along wavelength of 300 nm or longer, but shorter than 380 nm. The photocatalyst is present in the second treating room *or* third treating room (not in both rooms).

It would have at least been obvious to coat the UV irradiation cylinder **44** of JP

'887 with particles of titanium oxide of an orthorhombic crystal system because the UV irradiation cylinder **44** provides ultraviolet rays of a wavelength of 300 nm or longer, but shorter than 380 nm (= 300-420 nm) [page 2, ¶ [0008] and [0010]], and thus, would have been sufficient to initiate photocatalytic activity of the particles of titanium oxide of an orthorhombic crystal system when present.

Applicants state that there is no teaching or suggestion in Ohmori to use a photocatalyst in the presence of an irradiating energy, such as in the second treating room, produced from rays of longer than 200 nm but shorter than 300nm. In response, claim 19 as presently written does not require the second step to be conducted in the presence of a photocatalyst because the presence of a photocatalyst is not obligatory in the second treating room.

IV. Claim **22** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 10-155887** in combination with **Ohmori et al.** (US Patent No. 6,340,711 B1) as applied to claims 19-21 above, and further in view of **JP 10-249356** ('356).

The rejection of claim 22 under 35 U.S.C. 103(a) as being unpatentable over JP 10-155887 in combination with Ohmori et al. as applied to claims 19-21 above, and further in view of JP 10-249356 ('356) has been withdrawn in view of Applicants' remarks.

Claim **18** defines over the prior art of record because the prior art does not teach or suggest the method according to claim 15 wherein the method further comprises a step of irradiating the oxygen containing gas treated in said third step, with rays radiated from an infrared lamp and with rays radiated from a halogen lamp to dry the gas.

Claim **22** defines over the prior art of record because the prior art does not teach or suggest the apparatus according to claim 19 wherein said third treating room is further provided with a drying room wherein a portion for irradiating the oxygen containing gas treated in the third treating room, with rays radiated from an infrared lamp and a portion for irradiating the oxygen containing gas treated in the third treating room, with rays radiated from a halogen lamp are installed in order.

The prior art does not contain any language that teaches or suggests the above. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

Claims 18 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edna Wong
Primary Examiner
Art Unit 1753

EW
February 9, 2004